National Institute of Standards & Technology

# Certificate of Analysis

## Standard Reference Material® 2299

### Sulfur in Gasoline
### (Reformulated)

This Standard Reference Material (SRM) is a commercial reformulated unleaded motor gasoline intended for use in the evaluation of methods and the calibration of instruments used in the determination of total sulfur in gasoline or materials of similar matrix. A unit of SRM 2299 consists of 5 amber ampoules, each containing approximately 20 mL of gasoline.

**Certified Value:** The certified sulfur content provided in Table 1 is based on analyses by isotope dilution thermal ionization mass spectrometry (ID-TIMS) [1]. Homogeneity testing was performed using X-ray fluorescence spectrometry. The uncertainty in the certified value is expressed as an expanded uncertainty and is calculated according to the method in the ISO Guide [2]. The expanded uncertainty is based on a 95 % prediction interval.

Table 1. Certified Value (mass fraction)

Sulfur: 13.6 µg/g ± 1.5 µg/g

**Expiration of Certification:** The certification of this SRM is valid until **31 December 2008**, within the uncertainty specified, provided the SRM is handled and stored in accordance with the instructions given in the certificate (see *Instructions for Use*). However, the certification will be nullified if the SRM is damaged, contaminated, or otherwise modified.

**Maintenance of SRM Certification:** This material is considered to be stable during the period of certification. NIST will monitor this material and will report any significant changes in certification to the purchaser. Return of the attached registration card will facilitate notification.

The overall direction and coordination of the technical measurements leading to certification of this SRM were performed by J.D. Fassett of the NIST Analytical Chemistry Division.

Analytical measurements were performed by W.R. Kelly, J.L. Mann, A.F. Marlow, J.R. Sieber, and R.D. Vocke of the NIST Analytical Chemistry Division.

Statistical consultation for this SRM was provided by W.F. Guthrie of the NIST Statistical Engineering Division.

The gasoline for this SRM was donated by the ExxonMobil Company, Fairfax, VA.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the NIST Standard Reference Materials Group by B.S. MacDonald.

Willie E. May, Chief
Analytical Chemistry Division

Gaithersburg, MD 20899
Certificate Issue Date: 30 October 2002

John R. Rumble, Jr., Chief
Measurement Services Division

**INSTRUCTIONS FOR USE**

Each SRM ampoule should only be opened for the minimum time required to dispense the material. Once an ampoule is opened, the material must be used within a period of five hours to avoid a significant change in the sulfur content. To relate analytical determinations to the certified value in this certificate, a minimum sample mass of 150 mg should be used. The unopened ampoules should be stored under normal laboratory conditions away from direct sunlight.

REFERENCES


[1] Kelly, W.R., Paulsen; P.J., Murphy; K.E., Vocke; R.D., Jr.; Chen, L.-T.; *Determination of Sulfur in Fossil Fuels by Isotope Dilution Thermal Ionization Mass Spectrometry*; Anal. Chem.Vol. 66, pp. 2505-2513 (1994).

[2] *Guide to the Expression of Uncertainty in Measurement*, ISBN 92-67-10188-9, lst Ed. ISO, Geneva, Switzerland, (1993); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC (1994); (available at http://physics.nist.gov/Pubs/).

[3] May, W.; Parris, R.; Beck, C.; Fassett, J.; Greenberg, R.; Guenther, F.; Kramer, G.; Wise, S.; Gills, T.; Colbert, J.; Gettings, R.; MacDonald, B.; *Definitions of Terms and Modes Used at NIST for Value-Assignment of Reference Materials for Chemical Measurements*; NIST Special Publication 260-136, U.S. Government Printing Office, Washington, DC (2000).


*Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Group at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet http://www.nist.gov/srm.*